

PROVE THAT  $\left\{ \frac{1}{\sqrt{a}} B_{at} \right\}_{t \geq 0}$  IS BROWNIAN MOTION:

\* IS A GAUSSIAN PROCESS? OK

\*  $\frac{1}{\sqrt{a}} B_{a0} = 0$  OK

\*  $E\left(\frac{1}{\sqrt{a}} B_{at}\right) = \frac{1}{\sqrt{a}} E(B_{at}) = 0$  OK

\*  $\text{COV}\left(\frac{1}{\sqrt{a}} B_{as}, \frac{1}{\sqrt{a}} B_{at}\right) = \frac{1}{\sqrt{a}} \cdot \frac{1}{\sqrt{a}} \text{COV}(B_{as}, B_{at}) = \frac{1}{a} \min(as, at)$   
 $= \min(s, t)$

\*  $t \rightarrow \frac{1}{\sqrt{a}} B_{at}$  IS CONTINUOUS. OK